

ANALYSIS OF PARTIAL AND RECONSTRUCTED GEOTOPS IN THE AREA OF ORTHIC LUVISOLS

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Abstract: The paper focuses on the analysis of partial (BSEU) and reconstructed geotops, their dynamic qualities, in the area in the south-western Slovakia of orthic luvisols. Fig. 5, Ref. 9.

Key words: BSEU (bonitated soil-ecological units), partial and reconstructed geotops, dynamic geotops.

The contribution consists of two parts. The first, theoretical part is followed by empirical example, which is localised in the south-western Slovakia, in the southern part of Trnavská pahorkatina (area of basic map 1:5000 Pezinok 0 - 1). The altitude of this area is from 196 m to 213 m, substratum is loess and Neogene with quartz and amphibolit gravels, in smaller part Neogene build soil substratum. Orthic luvisols dominate in the area of loess, while stagno - gleyic luvisols are bound to Neogene lake sediments (KPP PPF, 1971). More generation level of loess is in special cases disrupted by solifluction level (in 60 - 90 cm depth) of small gravel and loess (Kolény, Baková, 1998). Ground water excluding artificial water reservoir absents, and character of soil water can be only assumed from sediment's character, it means porous. Micro and meso-climatic measurements absent and can be roughly included into warm climatic region A3 (Konček et al. In Atlas SSR, 1980). Vegetation is mostly secondary - fields of wheat, barley, maize and sunflower, but there are also intensive orchards and vineyards. Forest covers only very small areas, built by locust-trees and ash-trees, although original trees should be oaks with hornbeam (Michalko et al., 1986). Plateaus in different levels and back slopes of hilly country are typical relief of the area. Only on small areas are more significant slopes from 12 to 17 grades (probably 0,3 %), slope of 0 - 1 grades (40 %) and 1 - 3 grades (48%) dominate (Kolény, Jenčo, 1995).

"Partial geotops" are mapped on bonitated soil- ecological units (BPEJ - BSEU), with type codes 144.01, 144.12, 145.01, 145.03 (all partial complexes of Orthic Luvisol on loess substratum in the area of 347 ha) and 150.01, 150.02, 151.02 and 154.02 (partial complexes of Stagno-gleyic Luvisols on 133 ha), the rest is a forest (2 ha) and build environment (18 ha) (Podolinská et al., 1977).

Mentioned materials were thoroughly analysed, based on own fieldwork research results. Some parameters e.g. slope (Kolény, Jenčo, 1995) were also revised except new quality of partial natural geocomplexes, types and subtypes and partly substratum and depths (Kolény, Baková, 1998). Information database with about 200 tesseras (key points) was created, with parameters of soil levels, substratum, mesorelief and microrelief, and real vegetation (land use at the level of agri-cultures). Special attention has been paid to the soil solum depth. Goals of previous works were specialised in spatial analysis of digitally elaborated maps. Less attention was paid to casual relations of occurrence of certain attributes of partial geocomplexs and reconstruction of geotops into natural total geocomplexes, already indicated in the introduction.

Despite relatively homogenous environment of the area selected, which is used mostly as an arable land, less as an intensive orchard and vineyard and rarely as a forest and green areas, it is possible to get information about various qualities of natural landscape by detailed field work research. They are described in Figures 1 to 5. Figures 3 and 4 present schematic profiles of real landscape, others are completed by potential vegetation reflecting site qualities. Because they do not represent totality of natural complexes, they are called as the partial natural homogenous areas - partial geocomplexes. In case of completing with vegetation cover, they are considered to be the reconstructed partial geotops. Their dynamic qualities, which are derived from attributes obtained during fieldwork, determined (Mosiman, 1990) various function-dynamic classes of elementary process units in natural landscape. Perkotops, which dominate everywhere on very mild backs and slopes and on plains, where substratum is loess, are presented from the main classes (Hauptklasse) in the area. Konperkotops are localised in less frequent cases (in the area below contribution areas). Efluitops are localised in coluviums and valleys on Neogene clay. Afluitops till stagnotops are localised rarely (see Figure No 1 and 2) in surface run-off depressions. In connection with construction of water reservoir, also aquatop is localised here (aquatic system with open water level) and umitop is localised on its banks (see figure No 5). Technotops represent built area of communications, partly dumps can be included here.

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Legend (for all figures):

- 1 - Neogene clay minerals (sometimes with amphibolit and quartz skeleton, 2 - loess, 3 - swamp accumulation, 4 - dump, 5 - road, 6 - water, 7 - hornbeam, 8 - oak, 9 - alder and swamp, 10 - willow, 11 - culture steppe (field - meadow), 12 - block of slide, 13 - A-soilhorizon (subsoil), 14 - E - soilhorizon (eluviale), 15 - B-soilhorizon (iluviale), 16 - C_{ca}-soilhorizon (mother minerals), 17- Neogene blocks

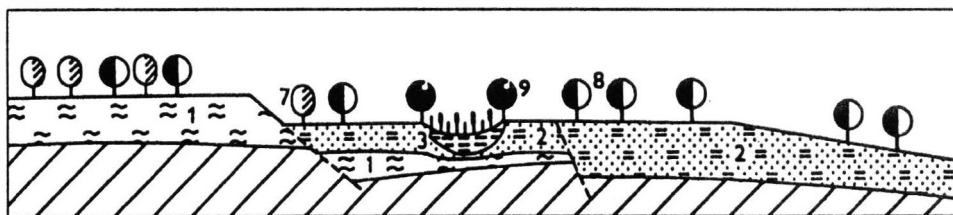


Fig. 1 Plain Landscape type on Neogene blocks with clay and loess, swamp accumulation in local depression

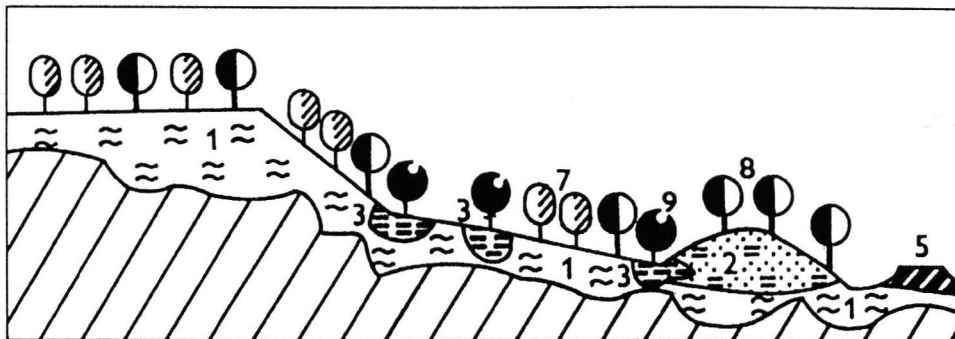


Fig. 2 Hilly country type on Neogene blocks with significant slope, local depression with swamp accumulation

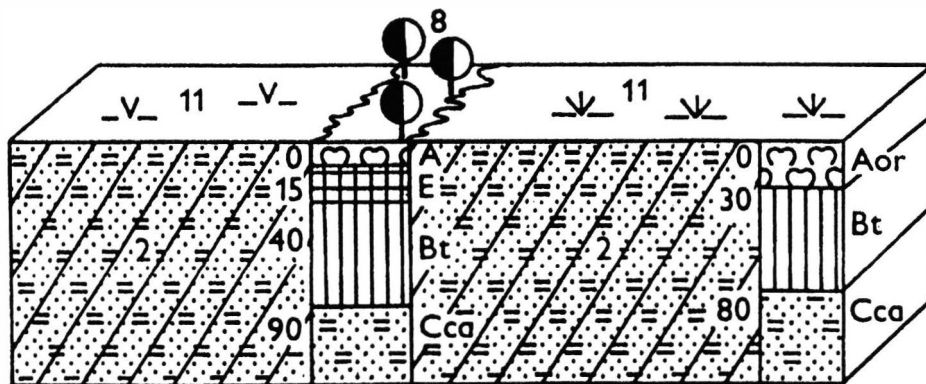


Fig. 3 Plain landscape type on Neogene plateau block, covered with thick layer of loess, anthropogenous variants of Land use in the homogenous area with typical soils (profiles)

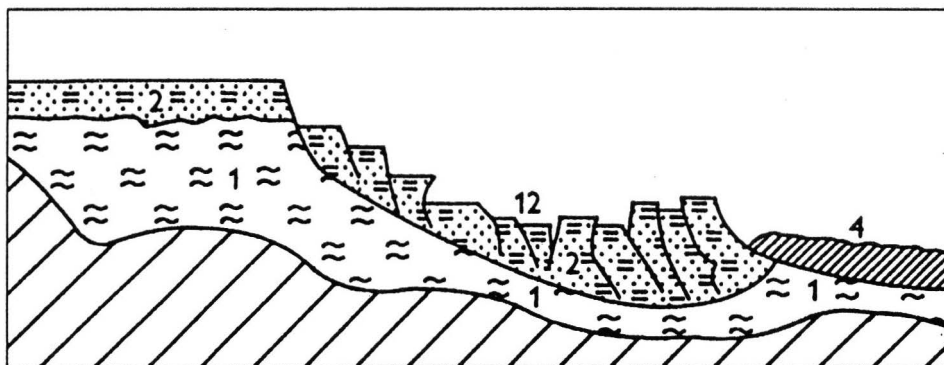


Fig. 4 Sliding area of Neogene clay with dump

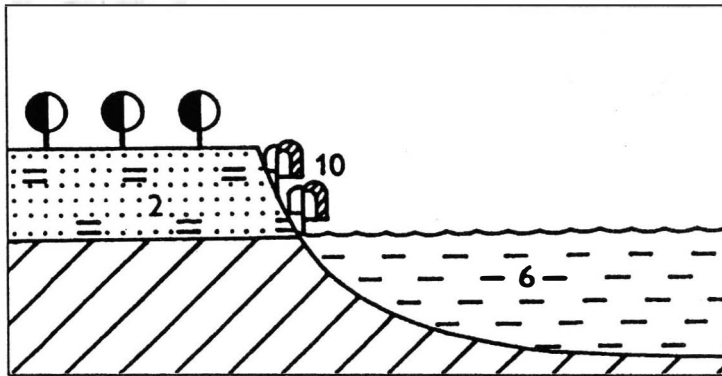


Fig. 5 Artificial border between loess table and water reservoir

Resume

Analýza typov čiastkových a rekonštruovaných geotopov v hnedozemnej oblasti

V príspevku z teoretického aspektu riešime vymedzenie geotopov (elementárnych homogénnych areálov), úplnosť ich prírodných komponentov, reálny zber dát čiastkových typov geoekotopov vrátane BPEJ (bonitovaných pôdno-ekologických jednotiek) a možností ich spresnenia, ako i rekonštruovaných prírodných typov geotopov, ktoré nenesú antropogénnosť variantov ich reálneho využitia. Uvedené je zároveň prezentované na konkrétnom príklade vybraného územia a tvorí integrálnu empirickú časť príspevku. Charakteristika územia juhozápadnej časti Slovenska konkrétne v južnej časti Trnavskej pahorkatiny v prietore Modra-Fajdal až Vištuk z aspektu významných atribútov skúmaných komponentov, najmä pôdy vo vzťahu k faktorom a podmienkam, tvorí významnú časť práce. V predošlých prácach z uvedeného územia sme sa venovali podrobne terénnemu pôdnemu výskumu a spresňovaniu priestorovej diferenciácie BPEJ, jednotlivých atribútov ako sú sklon, orientácia a hlavne hĺbka pôd. V predkladanom príspevku riešime formou reálnych rezov v území rekonštrukciu úplnosti prírodnej časti geotopov a ich dynamické typy v zmysle práce (Mosiman, 1990). Takto sme vytvorili prvé reálne dynamické geotopy z konkrétneho územia Slovenska. Doteraz bol problém v SR riešený len koncepcne (Mičian, 1999), s hypoteticky konštruovanými schémami.